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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,640	08/26/2003	Paul W. Buckley	135946-1	3895
23413	7590	04/05/2005	EXAMINER	
CANTOR COLBURN, LLP			ZIMMER, MARC S	
55 GRIFFIN ROAD SOUTH			ART UNIT	
BLOOMFIELD, CT 06002			PAPER NUMBER	
			1712	

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/648,640

Applicant(s)

BUCKLEY ET AL.

Examiner

Marc S. Zimmer

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 7-65, 68, 69, 71-74 and 77-112 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 108-112 is/are allowed.
- 6) ☒ Claim(s) 1-3, 7-65, 68, 69, 71-74 and 77-107 is/are rejected.
- 7) ☒ Claim(s) 1-3, 7-65, 68, 69, 71-74 and 77-107 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 02/14/05, 03/28/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### ***Claim Objections***

Claim 1, and the claims dependent therefrom are objected to because it is assumed that the steps delineated in the claim are intended to be followed in a sequential manner. If this is, in fact, the case, mention of the purification of the monohydroxyaromatic compound and solvent should appear before the reacting step ("optionally purifying the monohydroxyaromatic compound"). Likewise, mention of the purification of the individual polymers should come before the combining step. Claims 63, 78, and 107 also suffer from the same problem and are also objected to.

Claim 25 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Insofar as continuous- and batch filtration systems fully encompass every type of filtration system known, claim 25 does not further limit claim 22. (No matter what type of filtration device/setup/orientation is used, it necessarily will fall into the category of a batch filtering device or a continuous filtering device.

The Examiner attempted to convey this same idea in the previous correspondence but omitted the word "all" before "methods" in the second-to-last line of the objection.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3, 7-65, 68-69, 71-74, and 77-107 are rejected under 35 U.S.C. 112, first paragraph, because the Examiner has concerns as to whether one of ordinary skill would be able to practice the claimed invention without the burden of undue experimentation. That is, the scope of the claims is in doubt.

In every one of independent claims 1, 63, 78, and 107, a method is claimed wherein there are at least a minimal number of precise steps recited that are to be carried out in obtaining a polymeric material that is *substantially free of visible particulate impurities* (the italicized phrase is defined in more exacting terms in the Specification). For instance, in claim 1, all of the following steps are expressly stated:

- (i) adding water and a chelating agent to the reaction mixture to form an aqueous phase and an organic phase, and separating the aqueous phase from the organic phase, wherein the organic phase comprises poly(arylene ether).
- (ii) filtering the organic phase through a filtration system to remove particulate impurities, and
- (iii) isolating poly(arylene ether) from the organic phase.

If these steps in concert with the reacting, combining, and obtaining steps were believed sufficient to provide the polymeric material that is substantially free of visible particulate impurities, there would be no doubt as to the scope of claim 1. However, this would not seem to be the case because the final three lines also mention purifying the monohydroxy aromatic compound (the monomer), the solvent, the individual polymer

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materials, etc. In the Specification, there are identified numerous other manipulations that may be carried out in the name of achieving the larger goal of obtaining a mixture of poly(arylene ether) and poly(alkenyl aromatic) that is substantially free of visible particulate impurities. Among the other measures that can be taken are capping the PAE (paragraph 32), purifying the starting materials used in synthesizing the polymers (paragraph 45), using dedicated process equipment, adding a catalyst poison midway through the PAE-forming reaction (paragraph 49), using demineralized water for catalyst extraction (paragraph 49), pre-concentration of the solution to be filtered, etc. Ultimately, it is unclear what combinations of these measures should be used alongside those mandated by claim 1 to obtain the desired result.

It is notable that Applicant has disclosed in paragraphs 192 and 193 a comparative method that includes filtration and devolatilization but that these steps are inadequate for removing all visible impurities. The method is said to differ from Example 1, which apparently does provide the desired result, in that the comparative method (a) seemingly replaces double filtration through a combination of two sintered metal filters with a single gravity filtration through a gravity bag and (b) does not entail superheating the concentrated filtrate prior to extrusion. Were it not for Applicant's disclosure that the particular sequence of steps outlined in the comparative example does not provide the intended result, the skilled artisan might reasonably have expected said sequence to be effective insofar as the method disclosed by the comparative example adheres to the limitations of the originally claimed invention. (This, of course, ignores the fact that the claims have since been amended but it serves to illustrate the

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unpredictability associated with the process and casts doubt on whether one of ordinary skill practicing Applicant's invention could arrive at the intended result without undue experimentation were they to depart significantly from the limited number of working Examples furnished by Applicant.)

Assuming that the reacting, adding, filtering, isolating, combining, and obtaining steps expressly recited in claim 1 will not by themselves yield a polymer mixture substantially devoid of visible particulate materials, than it is not unreasonable to ask what other steps are minimally needed to accomplish the objectives of the invention. What if, in addition to these six steps, the monomers were purified by distillation prior to forming PAE and the polymer mixture<sup>was</sup> filtered once more through a second filtration apparatus after the combining step? Would this provide the level of purity sought by Applicant or would yet more manipulations be required? If both polymers were subjected to solution filtration prior to being isolated and then combined in the melt, would it then be necessary to filter the mixture once again after they had been extruded since paragraphs 14 and 15 of the Specification seem to suggest that extreme processing conditions lead to the formation of visible impurities? There simply does not seem to be enough guidance provided in view of the considerable scope of the claims.

Claims 63, 78, and 107 are broader than is claim 1 and, therefore, also lack proper scope of enablement.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 63-64, 68-69, and 71-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moritani et al., JP 63-256427. It is acknowledged that the reference does not explicitly teach a filter having any of the geometries outlined in claim 63. Indeed, the reference is completely silent as to the geometry of the filter apparatus. Nevertheless, it is the position of the Examiner that these filter types are those in standard use in industrial purification processes and, hence, could hardly represent a basis for patentability. Moreover, Applicant has illustrated no criticality for the geometry of the filtering apparatus. Indeed, the size exclusion characteristics of the filtering medium would seem to be far more critical to the success of the method. Finally, the skilled practitioner is capable of selecting the right filter based on considerations of slurry character, throughput, performance requirements, and permissible materials. Accordingly, the invention disclosed by this claim is obvious. The other claims are obvious for the reasons outlined in the last correspondence.

#### ***Allowable Subject Matter***

Claims 108-112 remain allowable. These claims would seem to be modeled directly upon the working example and, therefore, does not suffer from the same issues as do the others.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc S. Zimmer whose telephone number is 571-272-1096. The examiner can normally be reached on Monday-Friday 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 1, 2005

A handwritten signature in cursive script that reads "Marc Zimmer".

Marc Zimmer

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